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(54) **PROGRAMMABLE STREAMING PROCESSOR WITH MIXED PRECISION INSTRUCTION EXECUTION**

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This patent is subject to a terminal disclaimer.

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(52) **U.S. Cl.**

USPC **345/522**; 345/501; 345/502

(58) **Field of Classification Search**

USPC 345/426, 501, 502, 522, 530, 536, 559, 345/561

See application file for complete search history.

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(57) **ABSTRACT**

The disclosure relates to a programmable streaming processor that is capable of executing mixed-precision (e.g., full-precision, half-precision) instructions using different execution units. The various execution units are each capable of using graphics data to execute instructions at a particular precision level. An exemplary programmable shader processor includes a controller and multiple execution units. The controller is configured to receive an instruction for execution and to receive an indication of a data precision for execution of the instruction. The controller is also configured to receive a separate conversion instruction that, when executed, converts graphics data associated with the instruction to the indicated data precision. When operable, the controller selects one of the execution units based on the indicated data precision. The controller then causes the selected execution unit to execute the instruction with the indicated data precision using the graphics data associated with the instruction.

68 Claims, 6 Drawing Sheets